North Africa Regional Program

Introduction

The regional office of ICARDA's North Africa Regional Program (NARP) is located in Tunis, and it meets the research and training needs of Algeria, Libya, Mauritania, Morocco, and Tunisia. Besides having large areas under desert conditions, these countries have their agricultural production occurring within a diversified and highly fragile environment characterized by low and highly variable rainfall, extremes of temperature, short cropping seasons, shallow and depleted soils, steep slopes, and poor infrastructure, and inadequate policy support.

The scope of NARP's activities has broadened substantially in recent years. Morocco joined the CGIAR in 2003, and there is bilateral funding and other forms of support to some of the countries from donors like the USDA-FAS, Canada, and the African Bank for Development, which has enabled ICARDA to forge linkages for stronger partnership in research and human resource capacity building with NARS in the NARP region.

Achievements

ICARDA has implemented 65 projects in North Africa. These projects cover such areas as development of technology and management options for the marginal areas, people-centered research and development, diversification of income options, investment in science and technology, and building regional and international partnerships. Several achievements have been made from the projects during the period.

Technology and management options for the marginal areas

- Low-cost alternative feed production at the farm level: ICARDA has assisted farmers in developing alternative feed technologies such as feed blocks; shrub (*Atriplex numelaria, Acacia* spp.) and spineless cactus (*Opuntia* spp.) planting; alley cropping associating shrubs or cactus with barley, oat, feed legumes or natural vegetation, and the adoption of double-purpose (food and feed) barley cultivars. These technology options have been widely adopted by farmers, resulting in significant reductions in feed costs and less dependence on rangelands and markets for livestock feeds.
- Improved livestock flock management: Livestock farmers have largely adopted improved management options such as the use of improved rams, use of feeding calendar, culling of weak animals, and group mating (ram effect). These have helped them to improve the productivity of their animals and increase the market value of their livestock products especially during the Muslim ceremonies of Aid El Adha and Ramadan.

- Remote sensing and GIS technologies have been used to monitor the degradation of rangelands. Investigations have indicated the encroachment of cropping into the rangelands. There has been an increase in the cropping area by 14–20% in the last twenty years, a reduction in the quality of feeds from rangelands expressing high degradation, and the dissipation of palatable natural plants. Remote sensing and GIS technologies have proved useful in monitoring the rangeland degradation.
- Farmers in the region have adopted water harvesting and supplemental irrigation technologies, thus allowing better management of rainwater and scarce ground and surface water.
- Spineless cactus has been successfully introduced in Mauritania.

People-centred research and development

One major achievement in the region is the institutionalisation of the community approach and the use of community development plans as a means to empowering poor rural communities in the low rainfall areas. The governments of Tunisia, Algeria, and Morocco have adopted this approach in their development projects. Community models were developed to integrate the technological, institutional and policy options at the community level. These have been very useful to the farmers, extension agents, scientists, and policymakers in decision-making. Institutional options for the management of common rangelands, which combine the traditional institutions (*Jemaa*) and/or the agro-pastoral associations, were suggested. The sustainable livelihoods approach (SLA) was successfully implemented within the SDC-supported Maghreb mountains project, to enable the poor rural communities to better identify their needs, strength and opportunities.

Diversification of income sources

Major achievements in the diversification of income sources include the use of medicinal plants, durum end-products, and mountain products to provide additional income to farmers. NARP has specifically introduced the production of neglected plants such as medicinal and aromatic plants in Tunisia. It has mentored the establishment of a national network involving the research and development organizations, and the NGO and private sectors. It has also coordinated the *in situ* and *ex situ* collection and conservation of many species (*Allium roseum, Artemisia herb-alba, Rosmarinus officinalis*); identification of markets opportunities at the local, national and international levels; and the development of human resources. Building on these achievements, the Government of Tunisia has prepared a national strategy for the production of medicinal, herbal and aromatic plants.

In addition to these, new durum wheat varieties that are resistant to Hessian fly and tolerant to drought with low-cost cultural practices have been adopted by farmers in the marginal areas. The provision of seeds and the establishment of informal local seed enterprises, in addition to the promotion of traditional durum end products (*couscous*, pasta, *frikeh*), is helping in the improvement of farmers' income. Local mountain products such

as honey, walnut, olive oil, cheese, and goat meat have been identified as promising opportunities for improving and diversifying the income base of rural communities.

Investment in science and technology
ICARDA has invested in the application of biotechnology in crop improvement, especially in improving drought tolerance and resistance to abiotic stresses, in the North Africa region. Drought resistant genes have been identified in chickpea and durum wheat. The use of remote sensing and GIS technologies has proved efficient in addressing the degradation of natural resources, and as a tool for decision-making.

Building regional and international partnerships
During the last five years, ICARDA-NARP has organized several scientific workshops in addition to the regional coordination meetings, which provided opportunity for scientists in the region to exchange experiences, share knowledge, and develop project proposals. Enhanced partnership between advanced institutions, regional organizations and the NARS is a major achievement in the region, which is highly appreciated by the NARS.

Current Activities

Major ongoing activities in the North African region include:

- Research on improved methods of production of medicinal plants in Morocco
- The SDC-Maghreb Mountains project in Algeria, Morocco and Tunisia
- The durum wheat project (IRDEN), which is currently in its final year
- The project on improving the livelihoods of agro-pastoral communities (MM III) in eight countries
- Backstopping for Mauritania in participatory approaches, water and soil conservation, and rangeland and livestock management
- Project on benchmark/water scarcity
- Small ruminant management (supported by Austria)
- Five projects on crop improvement, genetic resources, INRM, and IPM under the bilateral arrangement between Morocco and ICARDA
- Watershed management in South Tunisia
- Bilateral program on wheat improvement in Algeria, in addition to the exchange of germplasm between ICARDA and the region

Future Plans

The North Africa region is facing a number of problems that threaten the livelihoods of the poorest sector of the society. ICARDA-NARP will address the following challenges in the immediate future:

i. Recurrent drought, being accentuated by the global climate change
ii. Water scarcity and inefficient water use
iii. Limited land resources and continued desertification
iv. Persistent rural poverty
v. Insufficient investment in science and technology in agricultural research
vi. Unfavorable policy environment

To tackle the challenges, ICARDA, in collaboration with the NARS and sister Centers, will use the following strategies:

i. Involvement of more countries in North Africa to join the CGIAR system, in order to increase investments in science and technology and reinforce their presence at the international arena
ii. Involvement of ICARDA in bilateral research initiatives with different countries and development projects, as well as in promoting trust funds in the region
iii. Focusing on the application of cutting-edge sciences
iv. Enhancement of people-centered research programs
v. Strengthening human capacity
vi. Promoting networking in order to strengthen south-south collaboration and help the weak NARS